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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,804	12/15/2005	Jawad Haidar	CU-4560 BWH	7414
26530 7590 07/09/2008 LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1600 CHICAGO, IL 60604				
EXAMINER ZHU, WEIPING				
ART UNIT 1793		PAPER NUMBER		
NOTIFICATION DATE 07/09/2008		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

### Office Action Summary

**Application No.**

10/560,804

**Applicant(s)**

HAIDAR, JAWAD

**Examiner**

WEIPING ZHU

**Art Unit**

1793

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 41-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 and 45-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-850)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 4/29/2008, 5/30/2006 and 5/12/2006



## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 1-40 and 45-63 are currently under examination.

Applicant's election with traverse of Invention I, Claims 1-40 and 45-63 in the reply filed on April 30, 2008 is acknowledged. The traversal is on the ground(s) that the Groups I and II share a single inventive concept, which is not shown in the prior art Timm (US 3,301,665) as cited by the examiner and it would not be an undue burden for the examiner to examine the claims in full. This is not found persuasive. As stated in the Office action dated April 1, 2008, the inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Groups I and II lack the same or corresponding special technical features of condensing zones. A vessel with heating and more than one condensation zone is taught by Timm (US 3,301,665) in column 1, lines 22-27). The common technical feature in Groups I and II is the condensing zones instead of the method as claimed in Group I. Furthermore to the contrary of applicant's assertion, it is proper for the examiner to make restriction requirements to 371 national stage applications as necessary. See MPEP 704.11 (b) I.

The requirement is still deemed proper and is therefore made FINAL.

### ***Comments***

2. The phrase "claim 38" in line 1 of claim 40 should be changed to "claim 39".  
A correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7, 11-40 and 45-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kametani et al. (US 5,032,176) in view of Murphy et al. ("Equilibrium Calculation of the Reduction of Titanium Tetrachloride by Aluminum and Hydrogen" High Temp. Chem. Processes 3, August 1994, pp. 365-374).

With respect to claims 1, 27, 29, 31, 33 and 34, Kametani et al. ('176) discloses a method to produce titanium-aluminum compounds comprising a first step of: reducing an amount of titanium chloride ( $\text{TiCl}_4$ ) with an amount of aluminum to trigger reactions at a temperature of  $100^\circ\text{C}$  to  $900^\circ\text{C}$  to form the products of the first step; and then a second step of mixing the products of the first step and heating the mixture in a reaction zone to a temperature above  $300^\circ\text{C}$  to form  $\text{AlCl}_3$  in a gas phase and to produce in the reaction zone of the titanium-aluminum compounds (col. 3, line 25 to col. 4, line 32 and col. 12, lines 10-19). Kametani et al. ('176) does not disclose the product of first step as claimed. Kametani et al. ('176) does not specify the products of the first step as claimed. However, titanium subchloride(s) and  $\text{AlCl}_3$  would inherently be present as the products of the first step of Kametani et al. ('176) when the aluminum is used as a reducing agent to reduce  $\text{TiCl}_4$  as disclosed by Murphy et al. (3. Results, pages 366-373). Kametani et al. ('176) does not disclose heating an amount of titanium

chloride ( $\text{TiCl}_4$ ) in a plasma of an inert gas and hydrogen mixture as claimed in the instant claim 27 and reducing an amount of titanium chloride ( $\text{TiCl}_4$ ) with hydrogen in an inert gas atmosphere or in a vacuum as claimed in the instant claim 29. Murphy et al. discloses the claimed features (paragraph bridging pages 365 and 366 and last paragraph, page 366). It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat an amount of titanium chloride ( $\text{TiCl}_4$ ) in a plasma of an inert gas and hydrogen mixture as claimed in the instant claim 27 or reduce an amount of titanium chloride ( $\text{TiCl}_4$ ) with hydrogen in an inert gas atmosphere or in a vacuum as claimed in the instant claim 29 in the process of Kametani et al. ('176) in order to reduce the cost for the reduction of titanium chloride ( $\text{TiCl}_4$ ) as disclosed by Murphy et al. (last paragraph, page 366).

With respect to claims 2, 3, 28, 30, 32 and 35, Kametani et al. ('176) discloses that the chloride of the reducing agent is constantly removed from the reaction zone as claimed (col. 7, lines 43-66).

With respect to claims 4, 46, 49, 52, 56, 5, 47, 50, 53 and 57, Kametani et al. ('176) discloses the first step is conducted in a temperature range of  $100^\circ\text{C}$  to  $900^\circ\text{C}$  (col. 3, line 25 to col. 4, line 32), which overlaps the claimed ranges. A prima facie case of obviousness exists. See MPEP 2144.05 I.

With respect to claims 6, 54 and 58, Kametani et al. ('176) discloses the first step is conducted with an excess amount of the reducing metal (col. 9, lines 1-14).

With respect to claims 7, 48, 51, 55 and 59, Kametani et al. ('176) discloses the second step is conducted in a temperature range of up to  $1000^\circ\text{C}$  (claim 1), which

overlaps the claimed range. A prima facie case of obviousness exists. See MPEP 2144.05 I.

With respect to claims 11-13, Kametani et al. ('176) in view of Murphy et al. does not specify the claimed features. However, these features would have been obvious to one of ordinary skill in the art. Both aluminum chloride and titanium subchloride would inherently be condensed away from the reaction zone at a temperature lower than that in the reaction zone as claimed, because the temperature in the reaction zone is higher than the boiling temperatures of aluminum chloride and titanium subchloride and there would be no condensations to occur in the reaction zone. Furthermore, it would have been obvious to one of the ordinary skill in the art to recycle the condensed titanium subchloride to reduce the cost.

With respect to claims 14-21 and 36-40, Kametani et al. ('176) discloses ejecting a chloride gas of at least one metal selected from aluminum, vanadium, chromium and zirconium into the reaction zone to form intermetallic compounds as desired (col. 6, lines 10-21). Kametani et al. ('176) does not disclose adding niobium to the reaction zone to form intermetallic compounds as claimed in the instant claims 20 and 21 and adding a reagent to a product to produce a further product as claimed in the instant claim 36. However it would have been obvious to one of ordinary skill in the art at the time the invention was made to add niobium to the reaction zone or a reagent to a product in the process of Kametani et al. ('176) in order to achieve desired physical and chemical properties as desired.

With respect to claims 22-24, Kametani et al. ('176) discloses that the reducing agent melt is atomized (col. 5, lines 12-19) without specifying the size and shape of the atomized reducing agent, which however reads on the claimed features.

With respect to claim 25, Kametani et al. ('176) discloses the method is conducted in an inert gas atmosphere (col. 15, lines 32-47).

With respect to claim 26, Murphy et al. discloses that the titanium-aluminum intermetallic compounds produced include  $Ti_3Al$ ,  $TiAl$  and  $TiAl_3$  (abstract).

With respect to claims 45 and 60-63, they are product-by-process claims. Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. In the instant case, Kametani et al. ('176) in view of Murphy et al. titanium-aluminum compounds (col. 3, line 25 to col. 4, line 32 and col. 12, lines 10-19), which reasonably appear to be only slightly different than the respective claimed products in the product-by-process claims as stated above. A rejection based on section 103 of the status is eminently fair and acceptable. See MPEP 2113.

4. Claims 8-10 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Kametani et al. ('176) in view of Murphy et al. as applied to claim 1 above and further in view of O'Donnell et al. (US 5,397,375).

With respect to claims 8-10, Kametani et al. ('176) in view of Murphy et al. does not disclose the claimed features. O'Donnell et al. ('375) discloses using metal fluoride to reduce metal oxide to produce titanium fluoride ( $TiF_4$ ) (col. 3, lines 44-56), which reads on the claimed features. It would have been obvious to one of ordinary skill in the



art at the time the invention was made to reduce titanium oxide by using aluminum chloride to produce  $\text{TiF}_4$  and aluminum oxide and electrolyze the aluminum oxide to produce aluminum raw material in the process of Kametani et al. ('176) in view of Murphy et al. in order to recycle the aluminum chloride as disclosed by O'Donnell et al. ('375) (col. 3, lines 44-56).

### ***Conclusion***

5. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 1793

/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

WZ

6/28/2008